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JUN 30

EXHIBIT B-2

IC-06-06-1034

Ravalli County Planning Dept Tuesday, June 27, 2006

To whom it may concern:

My name is William Cheek and I am writing you in regard and great concerns about the Aspen Spring proposed development in the Lower Woodchuck area, Florence, MT. Both my wife and I are Ravalli County residents. We temporarily live with a parent in Hamilton, MT, but currently own a property in the Upper Woodchuck area, Florence, MT, lot #. 20 to be precise. In short our property is to be our future home with in the next year or so and was carefully chosen for its peaceful rural setting and off the grid setting and location allowing us for a more ecological and self reliant alternative lifestyle.

The said proposed project is alarming us with great concerns on several levels, however my primary concerns are, and always will be, water and waste management. This area will not sustained another 636 wells in such a small and dense area. Most hydrologist and environmentalist, if not all, would agree and conclude that eventually it will result in a shortage of water for those of us who lives uphill from the future development, if not as well as the Aspen Spring community itself.
I also would like to raise another concern about waste management. Again another 636 septic systems on 223 acres will eventually be leaching down hill in close proximity of the Bitterroot River and Wildlife. What about water runoffs? What are the additional solid waste impact on the landfill and local environment?

Furthermore, can and will the local law enforcement deal with such a rapid influx in the Lower and Upper Woodchuck community right on a dead-end and border of the county line? Or the county at large for a matter of fact. Already, we have to deal with the constant nuisance and clean up trash or carcasses behind youth, teenagers, seasonal hunters, poachers, trespassers, etc..., doing whatever they came to do. All in an area with virtually no telecommunication other than cell phones reception.

After personal research I have additional concerns and unanswered questions. What are the immediate and long term effect on the local Wildlife and neighboring refuge and reserves? Will it affect local hunting? What are the impacts on the local fishing, guiding, hunting industries? How is it going to affect the school system? What effect will it have on all local taxes of any sort? Can the road system handle the daily demand of construction and commute? Is our EMS system ready for this additional community? Fire protection and prevention, what are the provision for accidental and wildfires (It seems too often to run uphill surely not jump the river)? And I could go on and on about so many issues and impact on our local community.

Finally, do not get me wrong here, I am an outdoorsman, and avid hunter with a profound respect for our environment, as well as our impact on it. I also have been a building contractor for 13 years now, with 18 years of experience in the real estate and building industry. By far, this has been the most ridiculous, aberrant project ever I have ever hear of with little or no contingency plan of what so ever. It spells out nothing but pure greed and no responsibility nor respect toward anyone or anything else. I realize that that socio-economic growth is unavoidable in the Bitterroot valley, but not this way. Nothing sounds reasonable or good about the Aspen Spring Project.

For your own research, you may find additional in formation on the following website www.fcaas.com. I Thank you for taking the time to read and acknowledge my concerns.

Sincerely yours,

Will Cheek

EXHIBIT B-3

Aspen Springs

Development can be a burden as well as a boon. Local communities, along with the State and Counties, can be left holding a large bag of expensive consequences when marginal agricultural land is converted to residential real estate. It's smart to recognize that short sighted planning and sudden dense developments are sure harbingers of future expensive problems needing ill affordable fixes.

This region of Montana will need more housing in the future, as Montana grows. The key word here is "FUTURE." The future is not now, and predicting the future is a fool's game. Future variables are fluid, dependent, and fickle. The only future constant is that Missoula is the local economic center and around it smaller communities flourish, at least they do at the present time.

The Florence area is already recognized as a bedroom community for the Missoula economy. Missoula is not expanding enough to support this sort of development. A glut of these homes already exists in Missoula, built by the same developer. Will Missoula's employed families need to purchase the properties in the proposed Aspen Springs subdivision? Will gas prices influence the undesirable nature of homes farther from Missoula? In addition, the "Baby-boom" retirees, presently moving to Montana, are probably not willing to accept Aspen Springs as a viable retirement option? This development is a quagmire for speculators, and it's not the bailiwick of Ravalli County Commissioners.

From my view, as a county citizen, Ravalli County isn't interested in expanding services, coverage, or obligations; it has been pointed out to me that the County has enough on its plate providing current needs. An extremely large subdivision located on the very fringe of the county, will thin Ravalli County's already overtaxed resources.

The true benefactor of this large development would be Missoula County. Ravalli County's only revenue is annual property taxes, which are offset by the services these taxes are meant to provide. In large part, all the other economic benefits claimed in the skewed economic analysis would be conceded to the Lolo and Missoula areas, both being in Missoula County. Therefore, this subdivision would become a cost-loss to Ravalli County and an economic sacrifice for Missoula's welfare.

Maybe the best answer is to request an equal land jurisdiction swap with Missoula County for other fringe boundary lands and then Missoula can have all the associated costs, since the benefits are theirs by default.

POLICE & FIRE PROTECTIONS:

Can the county provide adequate and speedy police coverage to this fringe location, via Hamilton? Is the Montana Highway Patrol capable of providing coverage and can they provide a backup role for assistance to this location? Can the Florence volunteer fire department handle the increased demand, or will "Aspen Springs" need its own fire unit?

HEALTH CARE:

What will the increased demand be on local hospitals and private physicians? They are already overtaxed and stretched to the limits in many regards. Please note, one of Florence's health care units relocated to Stevensville, leaving Florence with limited coverage.

SCHOOLS:

Increased school bonds will be needed to absorb the increases in child density. Can the local school system keep up with these instant demands? Are the local taxpayers willing to approve limitless requests for more money to keep up? What happens should a school bond issue fail?

TRAFFIC CONGESTION (at the 8-mile bottle necked turn off):

Will there be a traffic light placed at the junction of eight-mile road and the old Eastside highway; used to regulate high use times? This sort of infrastructure is expensive and tough to get approval from the State. This particular area is accident ridden already.

INCREASED TAX VALUES:

What about local land values; new subdivision values will increase the values of the surrounding homes, which means increased taxes. Increased property value is good if you are selling, but it gets expensive if you are not selling. Most local property owners are living on meager Montana economy incomes, or fixed incomes with little flexibility.

GARBAGE:

What about garbage generation and handling? Can the demand for services be provided locally?

WATER:

Can enough water be found on the property? Will the aquifer support these new demands; can water be located at levels that won't impact existing water well uses and other rights? Can the water be made nitrite safe from ongoing leeching pollution from the many development septic systems?

PRIVATE SEPTICS:

What about secondary, alternate, sewage drain fields; are there any? What's the contingency back up plan for unforeseen sewage problems?

AIR QUALITY:

What about air quality? I'm always hearing how the state is concerned with dust and vehicle pollution. The new owners will not limit their impact to their driveways and subdivision; they will travel on nearby gravel roads and other Ravalli County dirt paths.

THE ENVIRONMENT:

What about an Environmental Impact Statement (EIS)? Pollution from this development will make its way to the Bitterroot River and its fish and wildlife. More phosphates and nitrites will not be a good thing. Also, added pressure on local streams and rivers, to experience Montana's fishing will increase already tight competitors.

INCREASES IN STORAGE FACILITIES:

To enjoy what Montana has to offer, it takes a lot of toys. These items require storage space. Local storage unit facilities are already an obnoxious blight and they will have to increase, since Aspen Springs does not provide sufficient space to support storage of many items.

LOCAL FOOD AVAILABILITY:

Does Gary & Leo's grocery store have enough parking spaces to accommodate the evening shopping rush, or weekend shopping traffic; as weekday quick foods have taken over for many family prepared meals. The current demand already taxes the lot, as is.

THE DEVELOPER:

The economic impact proposal prepared by the developer's economist is menial rubbish and doesn't declare negative consequences and ultimately only proves money can buy results you want to project. This developer has a proven track record of using cheap, sub-standard, and inferior building materials and his operational strategy of abusing his sub-contractors shows him to be untrustworthy. He has exhausted nearly all relationships with local sub-contractors; few will ever work for him again, after their first experience. Any notion that he is concerned with our local economic welfare is spurious. His sole economic interest is his welfare.

The Ravalli County Commissioners have a responsibility to care for the welfare of all current county residents; including protection from adverse burdens. "Aspen Springs" will increase school taxes and other service burdens. It is your fiduciary obligation to act in the best interest of the majority of residents, and not in the interest of a developer with a self-serving dream.

The site is a poor fit for such a large venture saddled with basic water and sanitary problems and will, with no doubt, be served by overstretched ancillary county services.

I respectfully urge you to deny the "Aspen Springs" development proposal.

Thank you,

Chet Walker, M.P.A.

Chet Walker, M.P.A. (U. of Montana, 1990)
4780 Grayhorse Ln.
Stevensville, Montana 59870

EXHIBIT B-4

15 June 2006

Ravalli County Planning Department
215 South 4th Street, Suite F
Hamilton, MT 59840

RE: Aspen Springs Mega Subdivision in Ravalli County
Florence, Montana

Dear Sirs:

As a homeowner in the Riverview Orchard Landowners Association I am writing this letter in objection to the proposed Aspen Springs mega subdivision. I believe this mega subdivision will have a detrimental effect on the Local Services, Natural Environment, and Public Health & Safety of the Florence community.

As a Professional Engineer, I believe the Ravalli County Planning Board and Ravalli County Commissioners would be remiss if the following factors are not thoroughly considered when evaluating the Aspen Springs mega subdivision: location in Florence community (i.e., urban-wildland interface, lack of infrastructure, lack of public facilities, etc.), number of proposed residences, location of facilities on individual lots, and use of combustible construction materials.

In rural settings, the location of new developments is often overlooked for the sake of growth. Poor planning, lack of zoning requirements, and lack of county building codes result in public health and safety issues. One only needs to examine the fire history of southern California, Front Range of Colorado, and the Bitterroot Valley to see the devastating effects of large fire events in the urban-wildland interface. As Ravalli County continues to grow at a rapid pace, the fire risk associated with development in the urban-wildland interface grows at an equally rapid pace. As stated below, the issue is clearly defined in the challenge statement of the Bitterroot Wildfire Protection Plan (BWPP):

> *Few areas in the West have been harder hit in recent years by wildfire than the Bitterroot Valley. During the 2000 fire season, wildland fires burned over 356,000 acres of federal, state and private lands in and near Ravalli County. More than 1,500 people in Ravalli County were evacuated from their homes. Private property losses were high ranging in the millions of dollars. There were 70 homes, 170 other structures and 94 vehicles consumed by the fires. Millions of dollars were spent on the suppression efforts with more than 10,000 people supporting our firefighting efforts. Suppressing the fires is only the beginning. Rehab and recovery can take a decade or more and require additional financial resources.*
>
> *While catastrophic, the magnitude of wildfire in 2000 and again in 2002 and 2003 was not entirely unexpected. According to the Federal Wildland Fire Management Policy and Program Review adopted by the Federal land management agencies in December 1995, "nearly every state has experienced wildland urban interface fire losses." The Federal Fire Policy further states that the wildfire hazard "has become a major fire problem that will escalate as the nation moves into the 21st century...it is clear from recent episodes that losses will increase in the future".*

In July of 2004, the National Institute of Standards and Technology (NIST) conducted a series of full-scale laboratory experiments simulating the spread of fire from house-to-house. Results of the full-scale experiments showed it took less than five minutes for flames from a simulated

house with combustible exterior walls to ignite a similar "house" six feet away. Each experiment conducted at NIST involved two 16-foot structures clad in vinyl siding that simulated neighboring houses. The outside walls for each structure included windows. In the July 19 test, typical home furnishings were ignited in one "home" and the fire spread was recorded, along with heat release rates and other data. In less than five minutes, flames shattered the window of the home with the original fire, spread across the gap, and ignited the exterior of the second structure.

Interestingly, the 2003 International Residential Code (IRC R302 - adopted by the State of Montana) allows homes to be constructed within three feet of the lot line (i.e., two houses six feet away from each other) without requiring fire resistive construction materials. Given the proposed housing density in Aspen Springs and typical 7 to 10 minute response times for volunteer fire departments, a catastrophic fire event is poised to occur. As the results of the NIST full-scale test indicate, even if a building contractor complies with the minimum standards of adopted building codes, a higher standard of construction is warranted. The International Urban-Wildland Interface Code (IUWIC) requires these higher standards of construction.

The IUWIC defines the required class of ignition-resistant construction materials and methods depending upon the fire hazard severity. Map #5 - Condition Class - of the BWPP appears to indicate the Aspen Spring mega subdivision is located in a moderate fire hazard area. If utilized, the IUWIC could force the developer to space the residences farther apart, require ignition-resistant construction materials and methods, and require a larger volume of water for fire fighting. In the 2004 March / April issue of *Building Safety Journal - Observations from the 2003 Southern California Wildland Fires* - stringent zoning and construction requirements directly contributed in saving lives and millions of dollars in property damage. National Code Councils are incorporating these provisions into new codes and standards.

The 2006 National Fire Protection Association Life Safety Code (NFPA 101) now requires all new one- and two-family dwellings be constructed with fire sprinkler systems. Also, the 2006 IRC includes a new provision (Appendix P), which requires all new one- and two-family dwellings and townhouses be constructed with fire sprinkler systems. If Montana adopts Appendix P of the 2006 IRC, all new residences in the state could potentially have residential sprinkler systems incorporated during construction. Adoption of these new standards is the key to improving public health and safety. These new requirements are not only being implemented to protect occupants, they are also being incorporated to protect the safety of all first responders.

A recent report from the NIST, *Economic Analysis of Residential Fire sprinkler Systems - NISTIR 7277*, stated the following:

> *According to the United States Fir Administration (USFA), in 2004 there were a total of 410,500 residential fires and a total of 117 firefighter deaths with an average of 41% or all firefighter deaths resulting from residential fires. In 2004, residential fires caused 3,225 deaths, accounting for 83% of all fire deaths. Residential fires also were responsible for 14,175 injuries and $5.9 billion in direct property losses in 2004 according to the NFPA.*
>
> *A study based on 15 years of data from Scottsdale, Arizona categorized fire damage in two types of homes - those with fire sprinkler systems and those without fire sprinkler systems. Property loss due to a fire in a residential home with a sprinkler system was $2,166 compared to $45,019 in homes without a sprinkler system.*

Even though the Aspen Springs developer is offering to provide a building lot for a satellite fire station, the taxpayers will be asked to pay for the new satellite fire station, new equipment, and possibly a new fire station in Florence. Based upon the past mill levy failures for the construction

of a new school in Florence, there is a reasonable expectation the community will reject more infrastructure mill levy / SID proposals. Given the choice of higher taxes to mitigate life safety issues in an already overcrowded school - Aspen Springs will create an even greater problem - or satellite fire station infrastructure, I believe most parents will choose to construct a new school.

Finally, based upon the evaluation criteria in the *Ravalli County Growth Policy - Section 5.2: SUBDIVISION EVALUATION,* I strongly urge the Planning Board and County Commissioners to deny the proposed Aspen Springs mega subdivision. The Aspen Springs mega subdivision will negatively impact Local Services, Natural Environment, and Public Health & Safety in Florence. I believe county wide zoning standards should be developed and adopted, Ravalli County should implement and enforce a county wide building code program, the BWPP should specify FIREWISE construction materials and techniques (as documented in the IUWIC), and realistic impact fees be established and imposed on all new developments.

Respectfully submitted,

Kurt A. Anderson, P.E.

Enclosures (5)

NIST Tech Beat

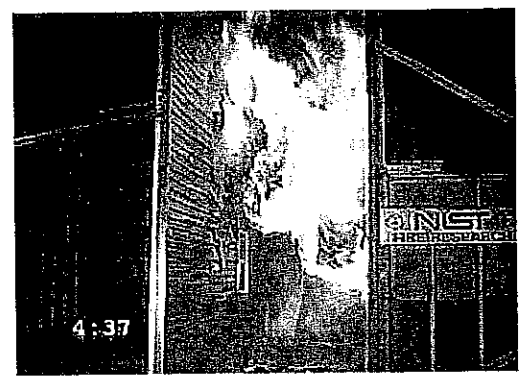
NIST National Institute of Standards and Technology

July 30, 2004

In This Issue:

Lab Experiments Simulate House-to-House Fire Spread

In a recent series of full-scale laboratory experiments at the National Institute of Standards and Technology (NIST), it took less than five minutes for flames from a simulated house with combustible exterior walls to ignite a similar "house" six feet away.



The experiments were conducted July 19 at the NIST Large Fire Facility. The tests, along with additional tests conducted on July 27 with more fire-resistant structures, are part of a program to develop computer models for predicting the spread of fire in residential communities.

In a recent NIST lab test, flames from a simulated house with combustible exterior walls ignite a similar "house" six feet away. The numbers in the corner are the time (in minutes) since the start of the test.

As land prices continue to rise, homes are being built closer together, many without fire-resistant materials. Building officials need information about the rate of fire spread in communities under various house spacing, construction methods and materials, and weather conditions. Fire departments also have to understand the time required for fire spread from one house to another in order to provide adequate response.

Each experiment conducted at NIST involved two 16-foot structures clad in vinyl siding that simulated neighboring houses. The outside walls for each structure included windows. In the July 19 test, typical home furnishings were ignited in one "home" and the fire spread was recorded, along with heat release rates and other data. In less than five minutes, flames shattered the window of the home with the original fire, spread across the gap, and ignited the exterior of the second structure.

The July 27 experiment measured the effects of a fire-resistant barrier in the exterior wall. Flames from the first structure again reached the second in about four minutes, but this time, the gypsum barrier prevented the fire from significantly damaging the simulated home.

NIST plans to summarize its results once an analysis of the tests is complete. Officials considering house separation regulations and/or the inclusion of fire-resistant barriers on exterior walls should find such fire spread data useful.

Media Contact:
John Blair, (301) 975-4261

Trade Center Analysis Classifies Victims' Locations in Towers

As part of its building and fire investigation of the World Trade Center (WTC) disaster, the National Institute of Standards and Technology (NIST) released an interim analysis on July 20 of the location of the 2,749 victims that classifies the decedents as being at/above or below the floors of impact and specifies the number of victims found in each of the WTC towers.

The analysis categorizes all names provided by the City of New York as decedents. It also identifies types of first responders who perished in the disaster. The analysis does not specify the names or exact locations of decedents.

Knowing the location of victims assists NIST in better understanding occupant behavior, evacuation and emergency response operations after terrorists flew two aircraft into the WTC towers, including the effects of aircraft impact, ensuing fires and overall building collapse. It also helps NIST to recommend possible changes in building design, construction, maintenance and operation that would improve the safety of occupants and first responders.

Observations from the 2003 Southern California Wildland Fires

by Mark Kluver, P.E.

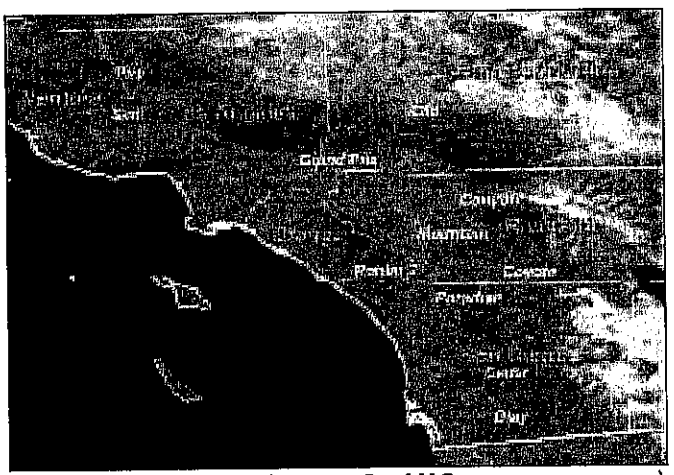
History has a way of repeating itself. In 1993, I traveled to Southern California to investigate the aftermath of the wildfires that occurred in October of that year. This was followed by publication of an article I authored on the subject in the January-February 1994 edition of *Building Standards* magazine. Almost exactly ten years later to the day, wildland fires again swept across Southern California from Ventura County to the Mexican border. What sets the recent fires apart was their size and the amount of destruction they caused, burning more than twice the area (approximately 745,800 acres versus 333,700) and destroying well over three times as many dwellings (3,339 versus 971) as compared to the 1993 fires. By the time the fires were subdued by cool, wet weather, 23 people had been killed and 174 injured. State officials estimate that damages from the recent fires will exceed $2 billion: the largest property loss from wildfires in the state's history.

Contributing Factors

Many factors contributed to the tremendous loss of life and property—some new, but most recurring. In late October or early November of most years, for example, hot winds blow off of the upper deserts and through the dry Southern California mountain ranges. In addition, forests in the region had experienced a multi-year drought, followed by a bark beetle infestation that killed huge stands of trees. The drought also created enormous amounts of fuel in the form of kiln-dried chaparral shrubs on lands near the Pacific Ocean, especially in San Diego County. Given these conditions, a spark was all that was needed to ignite a conflagration that the winds could spread uncontrollably.

There is no question that population growth and development in urban-wildland interface areas have also increased the risk of catastrophic fires. "There is almost a direct correlation between growth and the number of ignitions," says University of California, Berkeley, professor Tim Duane, whose statistical survey of California's Sierra Nevada mountain range indicates that a doubling of population may be responsible for a 5,000-percent increase in property damage.[1] Also, some housing has been built in so-called "indefensible locations" such as Palmer Canyon in the foothills of the San Bernardino National Forest, where 47 houses once stood but only 4 now remain. Other examples of indefensible locations include the narrow, miles-long canyon containing the Hook Canyon community where 350 homes burned and Crestline, a neighboring community that contained dozens of closely spaced wooden houses surrounded by dry, brittle pine trees which overhung roofs and porches.

The San Bernardino Mountains had not experienced a severe burn in nearly 100 years, in part due to the U.S. Forest Service's policy of suppressing fires, leaving the forests with an unprecedented buildup of fuel. In fact, two months before the fires, Texas A&M University forest ecologist Thomas Bonnicksen warned Congress, "never have I seen anything more dangerous than the overgrown, beetle-ravaged forest. [...] I am concerned for the safety of people living in communities surrounded by these forests."[2] Local politics also contributed to the problem. In the community of Lake Arrowhead, for example, a homeowners association had a longstanding policy of banning property owners from cutting trees in order to help preserve the area's natural beauty. The ban was lifted a year ago and some residents did what they could to remove the dead pines, but the buildup was too dense.



(Source: GeoMAC, www.geomac.gov.)

Mitigation Features

Despite the high losses experienced in the 2003 Southern California wildfires, the results could have been much worse if not for changes made in the wake of the 1993 fires. While many homes were lost, the adoption of local ordinances requiring special protection against wildland fires was critical to the preservation of tens of thousands of other dwellings along the several hundred miles of fire perimeter. Local adoption was helped along in part when state lawmakers passed the Bates Bill following the devastating Oakland Hills fire in October 1991. That legislation required the State Fire Marshal to designate high-hazard fire-risk zones and permitted local governments to require stricter building standards within these zones.

Local jurisdictions throughout California have set different standards for building in high-hazard fire-risk zones. While few have specifically adopted comprehensive mitigation provisions such as those provided by the *International Urban-Wildland Interface Code*™ (IUWIC™), most of the homes recently built in areas of high risk have at least some special features common to that code (see Table 1). The building features that appeared to have provided the most protection in the recent wildfires were noncombustible (or Class A) roofs and noncombustible exterior wall surfaces, primarily stucco. Other mitigation strategies such as protecting roof eaves, decks and unenclosed underfloor areas with noncombustible materials are also more common now than prior to 1991.

(continued)

Table 1. Summary of IUWIC Fire-Protection Features.

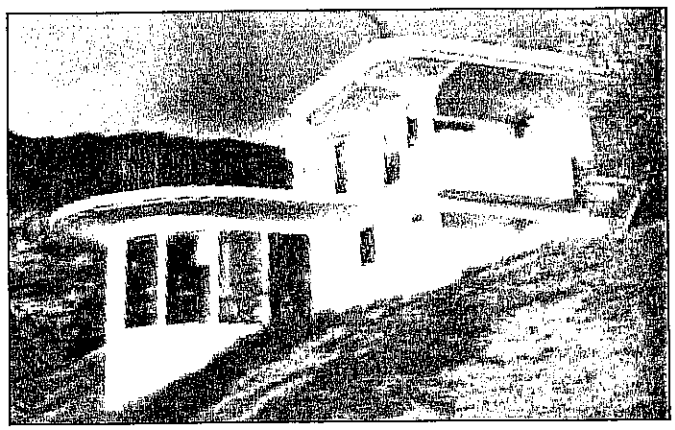
FIRE PROTECTION FEATURES	DESCRIPTION
Roof Coverings	Roofs are assigned a minimum roof covering classification (see Table 2). Spaces at the ends of eaves that allow entry to flames or embers are to be firestopped.
Eaves, Fascias and Soffits	**Class 1:** *Exposed undersides of eaves and soffits are to be protected by materials approved for a minimum of one-hour-rated fire-resistive construction. Fascias are required to be protected on the backside by materials approved for a minimum of one-hour-rated fire-resistive construction or 2-inch (51 mm) nominal dimension lumber. **Class 2:** *Combustible eaves, fascias and soffits are to be enclosed with solid materials with a minimum thickness of ¾ inch (19 mm). No exposed rafter tails are permitted unless constructed of heavy timber materials.
Gutters and Downspouts	Gutters and downspouts are to be constructed of noncombustible materials.
Exterior Walls	Exterior walls of buildings or structures are to be constructed with materials approved for a minimum of one-hour-rated fire-resistive construction on the exterior side or constructed with approved noncombustible materials. (Heavy timber or log wall construction may also be used.) Such materials must extend from the top of the foundation to the underside of the roof sheathing.
Unenclosed Underfloor Areas	Buildings or structures must have all underfloor areas enclosed to the ground with exterior walls constructed as required for "Exterior Walls," above. Complete enclosure is not required when the underside of all exposed floors and all exposed structural columns, beams and supporting walls are protected as required for one-hour-rated fire-resistive construction or heavy timber construction.
Appendages and Projections	Decks and other unenclosed accessory structures attached to habitable buildings must be a minimum of one-hour-rated fire-resistive construction. When any portion of detached structure projects over a descending slope surface by greater than 10 percent, the area below the structure shall have all underfloor areas enclosed to within 6 inches (152 mm) of the ground with exterior wall construction as required for "Exterior Walls," above. Complete enclosure is not required when the underside of all exposed floors and all exposed structural columns, beams and supporting walls are protected as required for one-hour-rated fire-resistive construction or heavy timber construction.
Window Glazing	Exterior windows, window walls and skylights are to be of tempered glass or multilayered glazing panels.
Exterior Doors	Exterior doors, other than vehicular access doors to garages, are to be noncombustible or solid core not less than 1¾-inch (45 mm) thick. Windows in doors shall be as required for "Window Glazing," above.
Attic and Underfloor Vents	**Class 1 and 2:** *Attic ventilation openings, foundation or underfloor vents, or other ventilation openings in vertical exterior walls and vents through roofs, shall not exceed 144 square inches (0.0929 m²) each. Such vents are to be covered with noncombustible corrosion-resistant mesh with openings not to exceed ¼ inch (6.4 mm). **Class 1, 2 and 3:** *Attic ventilation openings are not to be located in soffits, in eave overhangs, between rafters at eaves or in other overhang areas. Gable end and dormer vents are to be located at least 10 feet (3048 mm) from property lines. Underfloor ventilation openings shall be located as close to grade as practical.
Detached Accessory Structures	Detached accessory structures located less than 50 feet (15 240 mm) from a building containing habitable space must have exterior walls as required for "Exterior Walls," above. When any portion of a detached structure projects over a descending slope surface by greater than 10 percent, the area below the structure shall have all underfloor areas enclosed to within 6 inches (152 mm) of the ground with exterior walls constructed as required for "Exterior Walls," above. Complete enclosure is not required when the underside of all exposed floors and all exposed structural columns, beams and supporting walls are protected as required for one-hour-rated fire-resistive construction or heavy timber construction.

*Class 1, Class 2 or Class 3 ignition-resistant construction. See Table 2 for details.

Another feature that was critical to protecting dwellings from the firestorms was the more prevalent use of defensible spaces around individual dwellings or subdivisions. Defensible space is defined in the IUWIC as "an area either natural or man-made where materials capable of allowing a fire to spread unchecked has been treated, cleared or modified to slow the rate and intensity of an advancing wildfire and to create an area for fire suppression." Because of the combustible nature of many of the materials used, most dwellings constructed in California will burn if directly exposed to 60 mile-per-hour winds and extreme heat unless fire fighters are both quick to react and lucky. It is common practice for fire fighters to triage houses in neighborhoods exposed to fast-moving wildfires. If a dwelling cannot be protected within 15 minutes, a defense is staged at one that has a better chance of being saved. As a result, dwellings with the combination of a wood roof and minimal defensive space will get little aid from fire fighters unless there are no others demanding their attention.

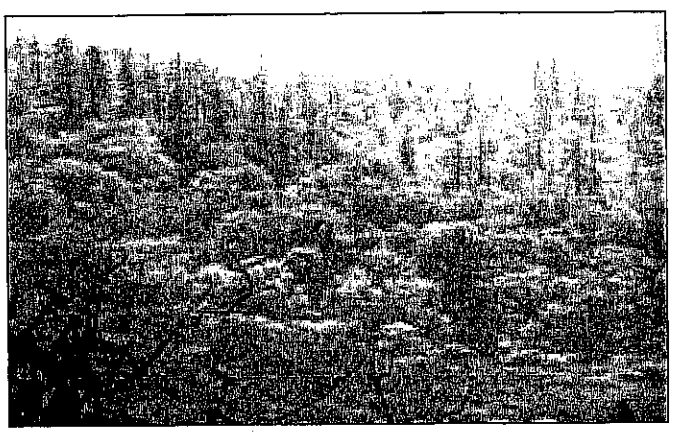
No better example of the significance of defensible space can be found than in Ventura County, which was spared widespread destruction even though more than 172,000 acres were burned in the Simi/Val Verde and Piru fires. Only 37 homes were lost in the county, out of a total of 3,339 destroyed throughout Southern California during the October 2003 wildfires. It is important to note that Ventura County's brush clearance laws are tougher than most, requiring homeowners to provide a 100-foot clearance around woodland homes each spring rather than the state's minimum 30 feet of clearance. Ventura's weed-abatement ordinance is backed by an aggressive enforcement program that includes sending approximately 14,000 warning notices to property owners each year. If a property remains in violation after a second warning, the county contracts for brush clearance and places an assessment on the owner's property taxes to recoup the costs. The program has been very effective, with the number of homeowners cited for violations dropping each year from a high of nearly 1,000 in 1991 to just 47 in 2002. During this same period, yearly assessments dropped from over $1 million in 1991 to less than $100,000.

Clearly, another critical factor in the preservation of life and property was the courageous efforts of the many fire fighters who responded to the emergency. Even with the skill that comes from past experience, defending against fires in urban-wildland interface areas is dangerous and grueling work. Mutual aid among neighboring fire departments as well as among regions and states is essential when major disasters like the 2003 firestorms strike, and the effective mobilization of over 14,000 fire fighters and support personnel from throughout the region at the height of the blazes cannot be underestimated.

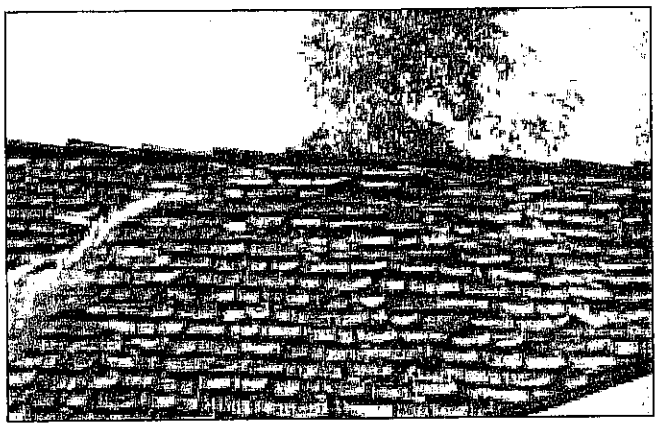


The unique roof eaves and soffits of this undamaged Ventura County home are consistent with the most stringent fire protection requirements of the *International Urban-Wildland Interface Code*™.

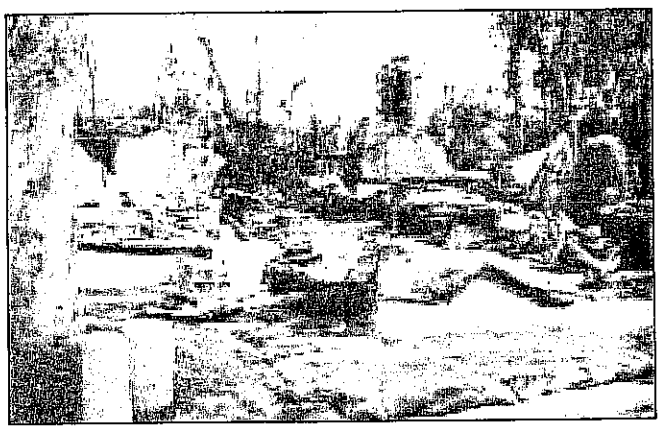
Combustible vegetation and trees like that surrounding this older San Diego dwelling were a major factor in property losses. A minimum defensible space of 30 to 100 feet surrounding subdivisions permitted fire service personnel to save more recently constructed homes.



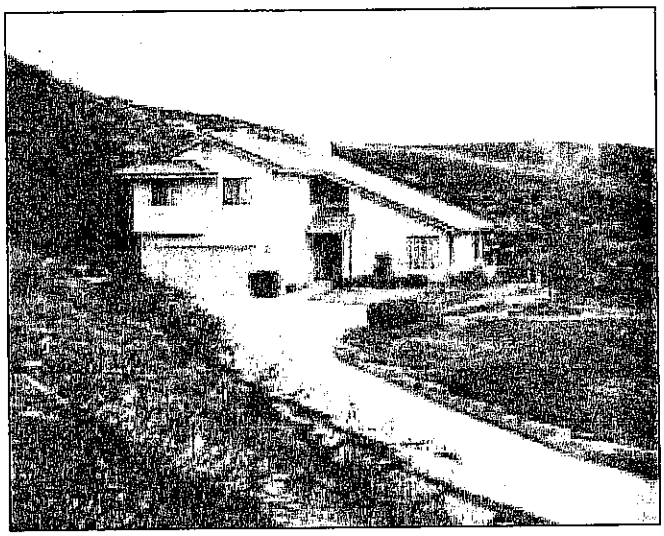
The 275,000-acre Cedar Fire that burned into San Diego suburbs was fueled in large part by dead and dying trees.



Old wood shake roofs were responsible for the loss of many homes in the Scripps Ranch community north of San Diego. In January 2004, the San Diego City Council banned the use of wood shingle and wood shake roofs.



Strong, erratic winds in San Bernardino drove wildfire through the Del Rosa neighborhood, destroying some homes and sparing others.



(continued)

HOW ONE HOME SURVIVED

Peter and Sharen McColl watched helplessly from a nearby roadway as a 100-foot wall of fire swept over their newly built home and horse stables. A few hours earlier, a 4-mile-wide finger of the Cedar Fire had swept across Interstate 8, the multilane freeway connecting southernmost California with Arizona. The fire would stop its push southward only a few more miles past their home.

When the McColls selected the home site—located on a mountaintop 1,000 feet above Harbison Canyon, a small community 15 miles east of San Diego—they knew it lay in harm's way. The sides of the mountain were covered with thick, dry chaparral, and they had decided to leave undisturbed the vegetation that grew among large boulders located only a few feet from their dwelling.

However, although their home was in a more vulnerable position, it survived while over half of those located below in Harbison Canyon were destroyed. The McColls clearly had luck on their side, but they had also made good decisions about how to build their home to withstand the potential threat of a firestorm. These included integrating construction features that met or exceeded those contained in the *International Urban-Wildland Interface Code*™ (IUWIC™) for structures required to be of Class 1 Ignition-Resistant Construction (see Table 2).

Concrete masonry was selected for the exterior walls of both the home and the stable, and the roofing of each structure was concrete roof tile. The horse stable was constructed without an eave, where an intense fire exposure might have caused ignition; and the combustible wood framing of the house eaves, including the fascia board, were covered with cement-based stucco. Among other features required by the IUWIC, the dwelling's windows had double-pane glazing.

There are a number of guides for homeowners who plan to build or retrofit dwellings in urban-wildland interface areas. Such information is important for the education of local citizenry, who are unlikely to read or fully understand why certain building regulations are necessary. A pamphlet published by the Institute for Business & Home Safety (IBHS), "Is Your Home Protected from Wildfire Disasters? A Homeowners Guide to Retrofit," is particularly worthwhile. It provides basic information in simple-to-understand language, but is fairly complete. As an example, it explains that structures constructed on sloping properties, like the McColl home site, are particularly at risk because "hot gases rise in front of the fire along the slope face, pre-heating the up-slope vegetation, moving a grass fire up to four times faster with flames twice as long as fire on level ground." The brochure also provides three checklists of critical steps that should be taken before, during and after a wildfire.

To get copies of the IBHS brochure, write to Institute for Business & Home Safety, 4775 East Fowler Avenue, Tampa Florida 33617; phone (813) 286-3400; or direct your web browser to *www.ibhs.org/publications/view.asp?id=130*. ◆

Table 2. Comparison of IUWIC Fire-Protection Features Based on Ignition-Resistant Construction Classification.

Fire-Protection Features	Ignition-Resistant Construction Classification		
	Class 1	Class 2	Class 3
Roof Coverings	YES (Class A)	YES (Class B)	YES (Class C)
Eaves, Fascia and Soffits	YES	YES[1]	NO
Gutters and Downspouts	YES	YES	NO
Exterior Walls	YES	YES	NO
Unenclosed Underfloor Areas	YES	YES	YES
Appendages and Projections	YES	YES	NO
Window Glazing	YES	YES	NO
Exterior Doors	YES	YES	NO
Attic and Underfloor Vents	YES	YES	YES[2]
Detached Accessory Structures	YES	YES	NO

1. Protection is less than that required under Class 1. See Table 1 for details.
2. Protection is less than that required under Class 1 and Class 2. See Table 1 for details.

Table 3. Wildfire Statistics.

Wildfires	Year	Acres (km²) Burned	Number of Dwellings Destroyed
So. Calif. Fires (Oct.)	2003	746,000 (3,014)	3,339
Aspen, AZ	2003	86,000 (350)	335
Rodeo-Chedeski, AZ	2002	469,000 (1,900)	467
Hayman, CO	2002	137,000 (55)	133
Biscuit, OR	2002	500,000 (2,020)	4
Cerro Grande, NM	2000	47,650 (190)	235
Oakland Hills, CA	1999	15,000 (61)	2,900

Conclusion

There are those who will argue that the October 2003 Southern California wildfires were in many ways a disaster foretold: that it was a tragic but predictable consequence of people wanting to live in forests and brushlands designed by Mother Nature to burn periodically. During a visit to the three hardest hit areas in Ventura, San Bernardino and San Diego Counties immediately after the fires' containment I found that, contrary to this dire outlook, the vast majority of newer dwellings in the vicinity of the fires' boundaries were still standing. This bears witness to the fact that building and fire safety officials in the affected areas should be proud of their efforts to educate the public and elected officials about the high priority of adopting and enforcing stringent building and associated wildfire mitigation regulations.

Without the promulgation of standardized provisions like those in the IUWIC, it would be very difficult to achieve the broad application of safe and sound practices to protect people and buildings within our forests and urban-wildland interface areas. Appreciation is therefore also extended to our national codes and standards writing bodies and the dedicated people who serve on their committees. Thank you for a job well done, and keep up the good work! ◆

References

1. Laura Parker, Tom Kenworthy and Patrick McMahon. "Areas 'Disaster Waiting to Happen'." *USA Today* Nov. 3, 2003: 4A.
2. ibid.

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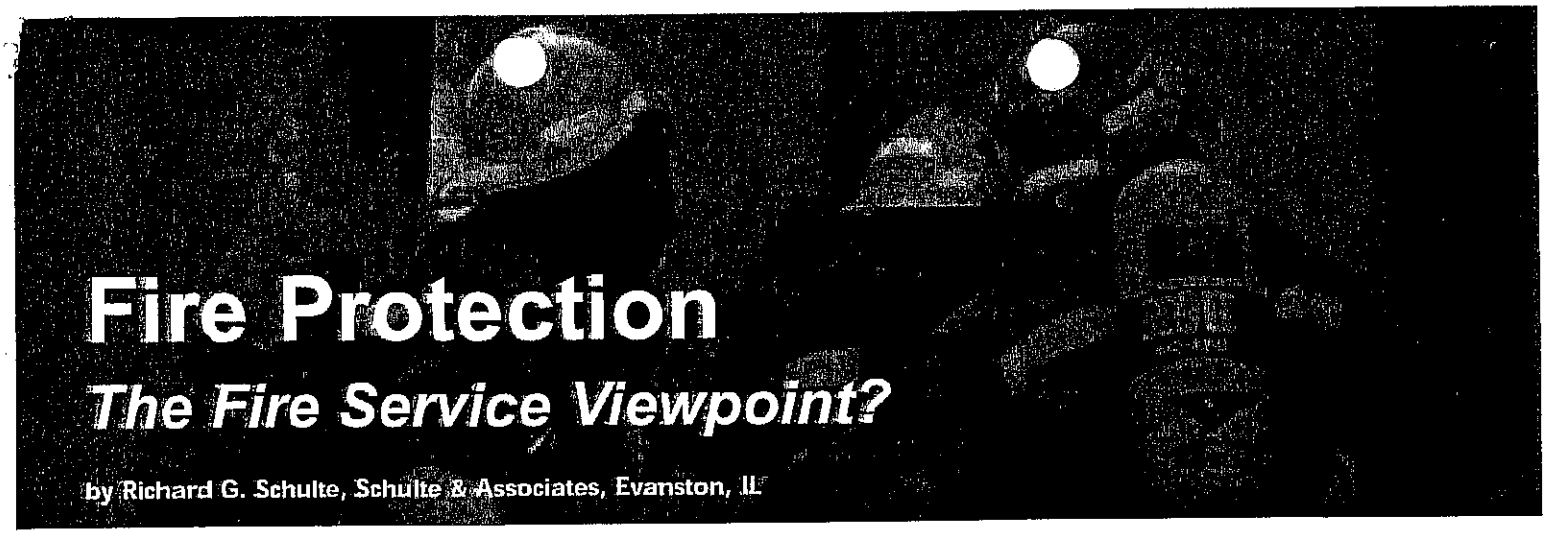
Acknowledgments

Recognition is given to the following individuals who contributed photographs and information for preparation of this article: **Paul Bambauer,** Executive Director, Concrete Masonry Association of California and Nevada, Sacramento, CA; **Chris Hastings,** Marketing Manager, RCP Block & Brick Inc, Lemon Grove, California; **Elizabeth L. Lile,** Cartographer, U.S. Geological Survey, Denver, Colorado; **Craig Morgan,** Fire Hazard Reduction Program Manager, Ventura County, California; and **Drew Probst,** Website Designer/Developer, U.S. Geological Survey, Lakewood, Colorado.



Fire Protection

The Fire Service Viewpoint?

by Richard G. Schulte, Schulte & Associates, Evanston, IL

The National Concrete Masonry Association's (NCMA) web site—*www.ncma.org*—includes several articles on building fire safety. Among the articles included on the web site is an undated article titled, "Are Architects, Engineers and Code-Writing Officials Friends of the Firefighter?" It was written by Chief Vincent Dunn, a former deputy chief with the New York Fire Department (FDNY). In the article, Chief Dunn puts forth he theory that modern construction methods—such as the use of wood trusses that utilize truss-plate connectors, composite wood joists, steel bar joists, steel trusses and other "lightweight" forms of construction, and the use of spray-applied mineral fiber fireproofing for structural steel members—are "unsafe" from a firefighter's perspective.

Some of the passages included in Chief Dunn's article are as follows:

As I continued giving lectures to groups of firefighters around the country, I began asking my audiences that question [Are architects, engineers and those who write building codes friends of the firefighter?]. *The answer I received most often was, "no, architects, engineers and codes officials are not friends of the firefighter."* [. . .] *But very rarely did anyone defend the architects, engineers and building code officials.*

The responses I received indicated to me a small rift between the architectural, engineering and codes-writing communities on the one side and the fire services community on the other side. This sentiment seems to be related to building construction methods and materials, and building codes changes incorporated into structures today.

One of the reasons for this rift involves lightweight construction. One firefighter dies every 18 months in the collapse of a burning building constructed with lightweight wood construction. The widespread use of lightweight wood truss construction and, especially the connecter [sic] *used to fasten members of this light truss together, are concerns to the firefighter.* [. . .] *Architects, engineers and codes officials are looked on by some firefighters as promoting this deadly construction. At least very few architects, engineers or code officials have spoken out against it.*

Another new design in building construction is the wooden I-beam. This lightweight beam is composition wood. Two-inch by four-inch boards serves [sic] *as a top and bottom flange. They are attached to a piece of particleboard, which acts as a web member. This composition floor and roof support is shaped as an I-beam and is promoted as "the silent floor beam." A so-called "silent floor beam" supported a structure where two firefighters were recently killed when the floor collapsed.*

Lightweight steel bar joints [. . .] *are another form of lightweight floor and roof construction used throughout the country that have the fire service alarmed.*

If the mission of the fire service is to protect life and property, just what are fire departments in the United States doing to reduce the death toll and property damage from traffic accidents on America's highways?

Another type of lightweight construction is the C-beam. [. . .] *It uses a bent shape to give it an increase in load bearing capability while reducing the actual amount of steel used in the steel member. Firefighters are holding their breath waiting to see how this new structure reacts to fire and collapse.*

Since the 1960s, builders have used "fluffy" spray-on fire protection covering steel. Instead of the heavy concrete encasement used in pre-World War II fire-resistive buildings, a lightweight mineral fiber is sprayed on steel to protect it from fire. The transition to the use of spray-on fire protection for steel has been fought by the fire services since its introduction in the New

This article originally appeared in the November, 2003, issue of Plumbing Engineer *and is reprinted with permission.*

York City building codes. [. . .] It would be unfair to totally blame architects, engineers and building codes officials for this inadequate fire protection.

Architects, engineers and code officials are not solely responsible for this revolution in construction methods and materials. There are building owners, designers, manufacturers and product sales representatives who introduce products that are deadly for firefighters and occupants of a burning building.

Today we no longer have fire-resistive buildings because the building industry has selectively neglected the concept of containment! If sprinklers or firefighters do not extinguish a fire, the building will not confine it.

Stair design and capacity still is based on the concept of a fire resistive building where fire will be confined to one floor. Under this theory, stairs need not have the capacity to hold all the people of the building. In fact, stairs are designed to allow only a limited number of people to leave a building. Remember the Titanic and the limited number of lifeboats? Similarly, the rest of the people must stay in place during the fire. This is a so-called "defend-in-place" fire-fighting strategy, and it is based on the idea that buildings will be fire-resistive. [The "defend-in-place" concept referred to is actually a staged approach to evacuating a high-rise building and is not a fire-fighting strategy.] *Sadly, we in the fire services know that is not true.*

The use of four-inch concrete floors over corrugated steel [decking supported on steel] *I-beams has failed at every serious high-rise office building in New York City. Floor steel-beam supports sag, warp and twist. The four-inch concrete floor sags with the steel and cracks and heaves. Smoke and flames spread to the floor above. Floor beams and concrete floor surface must be replaced after every serious fire.*

Scissors stairs are another design innovation recently incorporated in the building codes. The enclosing of two stairs in one building [enclosure] *is a cost savings that firefighters are concerned about, especially since the stair enclosures can now be constructed of two layers of sheet rock instead of masonry.*

At a lecture, a firefighter asked, "Who speaks for the fire service? Where does the official voice for the firefighter come from?" [. . .] Chief, I know where the firefighter goes for an official explanation. When firefighters are killed, we go to their widows. The families of dead firefighters are the voice of the fire service.

Obviously, the assertions made in Dunn's article are pretty serious charges against the building design industry and building code officials, but is there any real substance to his comments? To answer that question, let's first take a look at some statistics. Dunn's article contains only one statistic: "one firefighter dies every 18 months in the collapse of a burning building constructed with lightweight wood construction." Now, let's compare this statistic to the statistics on traffic fatalities in America. According to the National Highway Traffic Safety administration (NHTSA), 42,815 Americans died as a result of traffic accidents in 2002. This means that more than 60,000 Americans will die as a result of traffic accidents in a typical 18-month period. Compared with the one statistic cited by Dunn, the traffic fatality statistics are pretty sobering.

Of course, the statistics on traffic fatalities in the United States begs for another question to be asked and answered. If the mission of the fire service is to protect life and property, just what are fire departments in the United States doing to reduce the death toll and property damage from traffic accidents on America's highways? In response, at least some in the fire service would likely say that traffic safety is outside the jurisdiction of the fire service (just like emergency medical care was outside the traditional role of firefighters 30 years ago). It is my opinion, however, that if you are in the business of providing life safety services, then the most serious threats to life safety ought to be a priority. The statistics clearly show that traffic accidents have been a far more serious threat to life safety than fire for decades. (Recall that Ralph Nader got his start as a consumer advocate writing about auto safety in the 1960s.) I would hope Dunn could provide all of us with an explanation as to why the issue of the "dangers" of light-weight construction should be of so much more concern to firefighters than the issue of traffic safety.

It is my experience that most firefighters do not have a good understanding of building codes.

The traffic fatality statistics in the United States put Dunn's concerns in a far better perspective, but there are more statistics that are of interest in this discussion. In July 2003, the National Fire Protection Association (NFPA) published a report written by Paul LeBlanc and Rita Fahy titled, "Firefighter Fatalities in the United States—2002." Figure 1 (page 16) in the report provides a summary of firefighter fatalities in a 26-year period between 1977 and 2002. the NFPA statistics indicate that the number of firefighters who died while on-duty has ranged from a high of 172 in 1978 to a low of 75 in 1992. (A note to Figure 1 indicates that the 340 firefighter fatalities which occurred as a result of the collapse of the World Trade Center towers have been excluded from the statistics for the year 2001.) Figure 1 in the NFPA report clearly shows that the overall trend for on-duty firefighter fatalities in the United States in the last 26 years is downward. But if Dunn is correct about the dangers of the use of modern "light-weight" construction, wouldn't the number of

firefighter fatalities occurring be increasing over the last 26 years, rather than decreasing?

The NFPA report contains other statistics that are relevant to a discussion of Dunn's opinions regarding the "dangers of modern building construction methods. The NFPA report indicates that a total of 97 firefighters who died were career municipal firefighters, while the other 67 firefighters who died were either volunteer or forestry firefighters. Of the 30 career municipal firefighter fatalities, 14 fatalities occurred on the fire ground and seven fatalities occurred during training. The report further indicates that the most common cause of career firefighter fatalities in 2002 was heart attacks (12 fatalities). According to the NFPA report, six career firefighters died as a result of being "struck by or contact with [an] object," while eight career firefighters died as a result of being "caught or trapped." Interestingly enough, the NFPA report indicates that no career municipal firefighter died as a result of burns in 2002.

The NFPA report also provides information on the ages of the firefighters who died while on duty. Of the 30 career municipal firefighters who died while on duty, 25 of the firefighters were 31 years or older. Of the 12 career firefighters who died as a result of heart attacks while on duty, 10 of these firefighters were 36 years or older.

What do these statistics mean? Among career municipal firefighters, heart attacks remained the leading cause of fatalities in 2002. And, as would be expected, older firefighters are more likely to die as a result of a heart attack. Neither of these conclusions is a revelation. Almost everyone in the fire service already knows that heart disease is the primary killer of on-duty firefighters.

What these statistics also indicate is that there is not an epidemic of firefighter fatalities as a result of the collapse of modern lightweight building construction. Perhaps, the reason for this is Dunn's efforts to warn firefighters of the hazard, but more than likely the reason why there is no epidemic of firefighter fatalities due to building collapses is that the hazard that Dunn warns about is a theoretical hazard. Theory makes for a great presentation in a lecture, but it's hard to argue with reality reflected in the actual statistics.

Now, to the subject of the "rift" between building code enforcement officials and the fire service. Is there a rift between the career municipal firefighters and municipal building code enforcement personnel? Sadly, Dunn is probably correct in this regard. While I agree with his opinion, I disagree on the cause of the rift. In my opinion, the reason for the rift is the fire service's lack of understanding of building codes, code development and code enforcement.

It is my experience that most firefighters do not have a good understanding of building codes. Also, it is my experience that most firefighters do not have an understanding of how building codes are developed, and that firefighters are welcome to participate in the process. Finally, most municipal firefighters do not understand that they are responsible for the enforcement of the fire prevention code, and that the fire prevention code requires compliance with the building code. It is easy for firefighters to complain about building codes and building code enforcement, but do they have any right to complain if they don't participate in the process?

Perhaps, many in the fire service will disagree with me remarks about firefighters and building codes. If so, then perchance members of the fire service might want to ask themselves the following questions:

- Do you have a copy of the proposed changes to the 2003 editions of the *International Building Code*® and *International Fire Code*®?
- Have you reviewed the proposed changes to the *International Building Code* and *International Fire Code*?
- How many of the changes to the *International Building Code* and *International Fire Code* were proposed by the fire service?
- How many members of the fire service actually attended the recent code change hearings for the *International Building Code* and *International Fire Code*?

As I reviewed the code change proposals to the 2003 edition of the *International Building Code*, one of the things I noted was that there are no code changes proposed by Dunn. Given his opinion, that's rather interesting, don't you think? ◆

Note: The article written by Chief Vincent Dunn discussed in this column can be found on the National Concrete Masonry Association (NCMA) web site at the following address: http://www.ncma.org/online/fire.html. *The traffic fatality statistics cited can be found on the National Highway Transportation Safety Administration web site at the following address:* http://www.nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSFAnn/ TSF2002EE.pdf.

***Richard Schulte** is a 1976 graduate of the fire protection engineering program at the Illinois Institute of Technology. After working in various positions within the fire protection field, he formed Schulte & Associates in 1988. His consulting experience includes work on the Sears Tower and numerous other notable structures. He has also acted as an expert witness in the litigation involving the fire at the New Orleans Distribution Center. He can be contacted by sending e-mail to* rschulte@plumbing engineer.com.

This and several of Mr. Schulte's previous columns comprising a series on the World Trade Center collapse can be downloaded (in PDF format) from the Plumbing Engineer *web site,* www.plumbingengineer.com. *They are located in the "Resources" section.*

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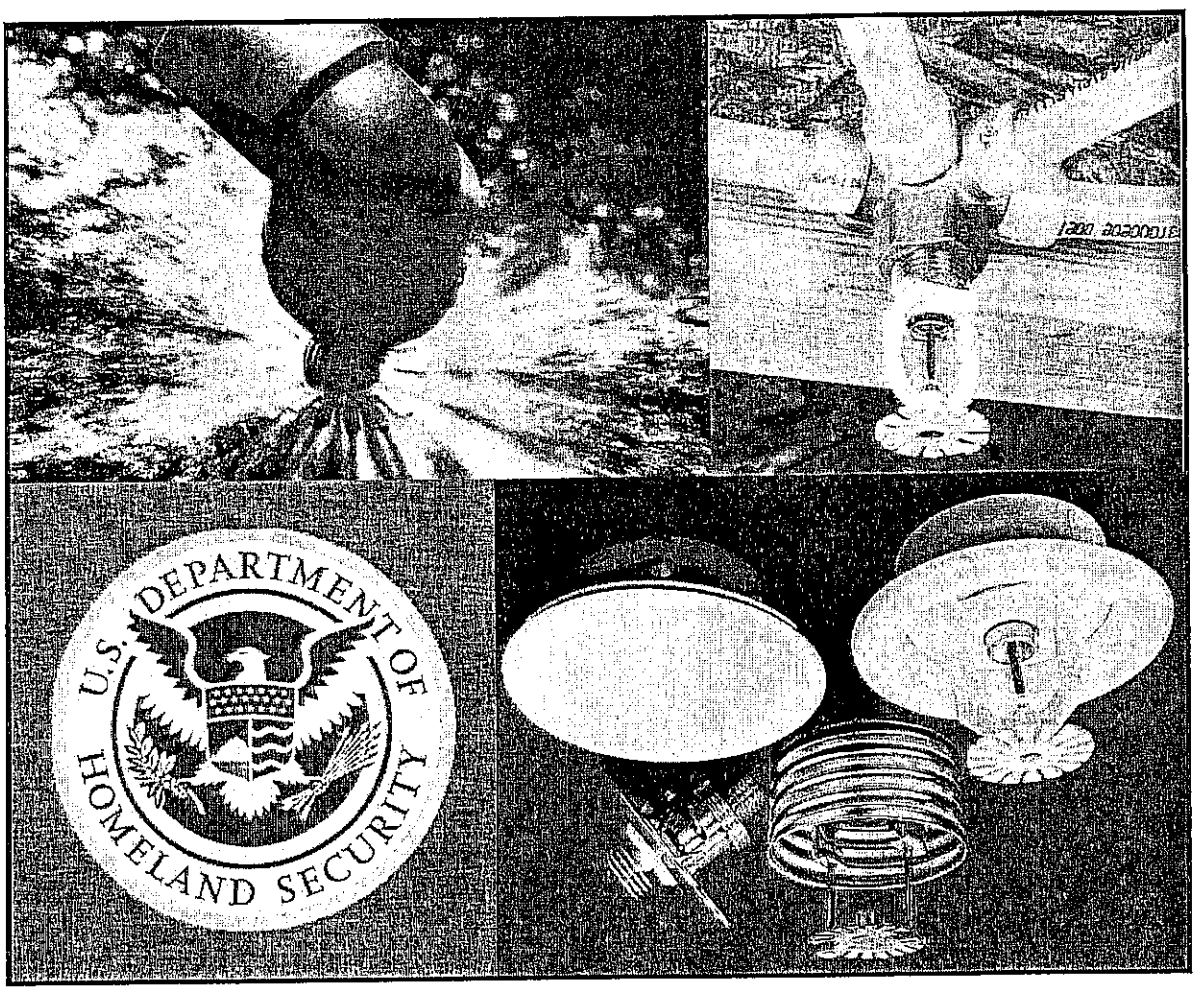
Economic Analysis of Residential Fire Sprinkler Systems

Hayden Brown



A Bolder Boulder

County Races Ahead with Wildfire Mitigation

"The truism is that wherever you have wildlands... you will have wildland fire."

— *Stephen J. Pyne, World Fire*

THE HISTORY OF THE BOULDER VALLEY in Colorado is in many ways the history of the American West.

For hundreds of years, the land of the Boulder Valley was used by American Indians to hunt and plant, and the area was a winter home for the Southern Arapahoe. Tribes of Comanche, Ute and Cheyenne also frequented the valley.

When the gold rush came to what is now Boulder County in 1858 and the first permanent, non-native settlement was established, it heralded a fundamental shift in the use of the land. Three years later, the Arapahoe and Cheyenne tribes relinquished their land rights and settlement of the region intensified.

By the time Boulder City was incorporated in 1871, the town was already taking shape, and soon the University of Colorado would open and the railroad would arrive. Subsequent years would bring still greater change, as infrastructure expanded to accommodate the influx of new residents and tourism became an increasingly important part of the local economy.

Census figures help tell the story of the city's growth: In 1920, there were 11,006 residents, in 1940 there were 12,958, and by 1950 there were 20,000. As new industries emerged and housing opportunities expanded, the population grew to 72,000 people in 1972. Today, there are more than 96,000 Boulder residents, with an additional 25,000 students at the University of Colorado. Overall, more than 291,000 people live in Boulder County.

But even in the midst of this dramatic change, townspeople showed a determination to preserve the environment around them. According to the city's official Web site, "Even before the turn of the century, it was clear to early Boulder residents that the mountain backdrop was a special place, and the city began to acquire Mountain Parks property[.]"

That commitment remains a hallmark of Boulder's development, demonstrated more recently by the purchase of thousands of acres of open space and the adoption of a comprehensive growth management plan. In all, the city owns 60,000 acres of undeveloped land, which is larger than Mesa Verde National Park in southwestern Colorado. Boulder County has another 70,000 acres that it is has preserved as open space.

Yet by retaining so much of the natural environment, residents of the Boulder Valley have created a challenge for themselves: How can they continue to live safely within the beauty of rustic settings while addressing the wildfire threat that is such an enduring part of nature?

'Rural renaissance'

Stephen J. Pyne is a professor at Arizona State University and a leading expert on fire and its role in shaping global landscapes. In his 1995 book *World Fire*, he addressed the wildfire risks associated with what he called the new "rural renaissance"— the shifting of populations from urban to rural lands:

> From the perspective of fire protection the intermix environment is often the worst of all worlds.... There is little zoning for fire control. There are few building codes to reduce hazards such as wooden roofs. There is scant pressure to reduce wildland fuels around dwellings. Open spaces that serve as buffer zones shrink as houses and woodlands expand.... Narrow roads to sheltered homesites, rustic wooden houses with shake-shingle roofs, lush vegetation dripping over walls and roofs, distances from prying officials and taxes—all this is why the exurban communities were created. To render them fireproof is to re-create the environments from which the residents fled in the first place.

city's building code be amended to prohibit wood roof coverings—including shakes and shingles—he knew it would be a long, difficult process.

The local building and planning board, which is responsible for enforcing the code, would have to sign off on the proposed ordinance. The elected city council would have to approve it. Arguments from the wood roofing industry would have to be anticipated and addressed. And perhaps most importantly, residents would have to be persuaded that the change was a necessary and prudent step.

One thing happened, however, that Donner didn't anticipate—he was sued.

"Shortly after the city council passed the ordinance, the wood shingle industry sued the City of Boulder and sued me personally," he recalled. "They sued me for defamation of the industry because I said that 'wood burns.' "

But as the trial would ultimately demonstrate, the Boulder Fire Department had done its homework before proposing the ordinance.

The process actually began a couple of years earlier, when in the course of updating the city's codes the department tried to locate a wood shingle on the market that maintained its flame-resistance rating after actual weather testing. At the time, the department couldn't find any shingles that passed the Uniform Building Code (UBC) weather tests and qualified for re-certification beyond the initial three-year period.

"So we made the decision to ban wood shingles entirely—treated or untreated," Donner said. Even though parts of Boulder are not immediately adjacent to the wildland/urban interface, it was also decided that the roof ordinance should apply citywide.

"Western Boulder is next to some wildlands," Donner said. "We have prevailing westerly winds, so any fires that would start to our west would quickly be blowing toward the city given our normal weather patterns. We knew that if we had significant spotting and started some roofs on fire that we were at high risk for urban conflagration just due to the high numbers of wood shingles we had."

Donner and his colleagues brought the proposal to the building and planning department, which reacted favorably, and together they took the next steps. According to Boulder Deputy Fire Chief Steve Stolz, who was head of the department's division of prevention in 1993, "We started our planning by looking at what we would put out in front of the community, our rationale for the change. We also knew the wood roof industry would not go quietly and let us do this."

At the many community forums, administrative hearings and council sessions that followed, the fire department made its case, and there was surprisingly little reaction from residents. While a handful of community members voiced some opposition, most showed little interest, even though the initial proposal would have required that all homes in the city change to non-wood roofing within 10 years.

"The public was generally very good," Donner said. "If you have a meeting and explain the problem, the public will understand. Even though we hadn't had any catastrophic fires, most people here were familiar with the problem."

As expected, though, the wood shake and shingle industry did take notice, and representatives soon arrived in Boulder. While Boulder was the first community in Colorado to pursue a ban on wood roof coverings, it was not the first jurisdiction in the country to do so. In fact, Los Angeles was going through a similar process at about the same time. Donner thinks he knows why Boulder drew so much attention.

"Other communities have banned untreated wood shingles, but what alarmed the wood shingle industry is that we went after the treated shingles as well," he said. "They didn't want us to take any action because they thought other communities might copy us."

The proposed ordinance was eventually approved by the city council, with one key modification. Rather than a 10-year phase in, the council elected to provide a 20-year window

Boulder Fire Chief Larry Donner

division chief for the city of Boulder, has seen the problem in subdivisions throughout the United States, particularly in the West.

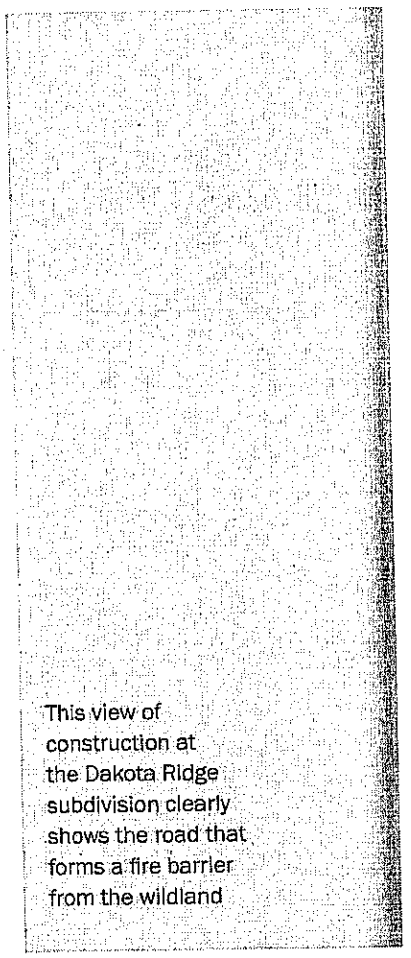
"What typically happens in the interface is that you end up with homes directly up against the open space," he explained. "The difficulty is that the water is on the inside where the road is and the homes are on the outside. So to protect these homes you have to park an engine in the subdivision, hook up to the hydrant and wrap the hoses around the outside of the houses.

"Then you have to go and put firefighters in harm's way."

The process that led to the construction of Dakota Ridge actually began in the early 1990s, when local developer Rich McCabe moved to build on the 57-acre site, which at the time was one of the last major pieces of undeveloped land in the city. From the beginning, the project received significant attention.

"It is a unique subdivision," said Brent Bean, a senior planner with the Boulder Planning Department. "It is on the fringe of the city and it is right at the step of the foothills in open space areas."

Bean, whose father was the first planning director for Boulder, said that once the project was introduced the city's planning and fire departments worked closely with McCabe and his team. As it turned out, there was common ground that served the interests of everyone, and it involved a bold proposal — place a road around the exterior of the subdivision, with hydrants, to act as a buffer between the housing and the open space.



This view of construction at the Dakota Ridge subdivision clearly shows the road that forms a fire barrier from the wildland

of this effort, the Boulder County Wildfire Mitigation Group was born.

As the group met, it became apparent that helping responders pre-plan and educating the public about risks would be top priorities. But according to Nan Johnson — who joined the county planning staff in 1991 and started attending sessions of the wildfire mitigation group soon thereafter — something else grew equally apparent.

"To talk about hazards to homeowners, we realized that we needed to have a better understanding of them ourselves," she said. "We needed to know what the hazards were, where they were and what it would take to mitigate them."

Johnson came to the group with a background in Geographic Information Systems (GIS), and she and others thought that the county's already-existing GIS system could be an effective way to pull all the pieces together and show fire protection issues in a dynamic way. As the discussions grew increasingly more technical, it was decided that a separate working group would form to examine the issue.

That was the beginning of what is now called the Wildfire Hazard Identification and Mitigation System, or WHIMS, and the beginning of a years-long crusade for Johnson and her colleagues.

Although the county already had access to some helpful material, such as lot boundaries, ownership records and other parcel data from the assessor's office and topographic figures from the U.S. Geological Survey, the specific fuel-type and homeowner assessment information needed to plug into GIS for a complete picture did not exist.

So the WHIMS team elected to go out and get it, developing a questionnaire and planning one-on-one, on-site interviews with area landowners. "We decided we were going to take a project area and start with one local fire district," Johnson said. "We also put a lot of time into figuring out what questions to ask."

Marc Mullenix (foreground) and Justin Dombrowski, Boulder Fire Department

At the same time, the Colorado State Forest Service undertook a survey of its own to generate critical data about area fuel types.

Johnson said that defining what makes a hazard was a learning process for everyone. A turning point came when the group shifted from its initial assumption that water and access were the chief culprits.

"We learned through our firefighters that they aren't, because in this county we don't have water and we don't have access," she said. "So the emphasis in the surveys became building location, construction, landscaping and defensible space."

One other key question remained: Who should conduct the surveys? A lengthy debate followed, and it was finally decided that — despite the size of the job — volunteer firefighters should handle the assignment.

"They are the ones that need to respond to these events," Johnson said. "They are the ones that need to know the property. That is their constituency. The homeowners need to get the correct answers and need to be asking their volunteer firefighters these questions."

Getting the 20 fire protection districts in Boulder County on board involved a series of discussions in which the WHIMS team had to demonstrate the tangible benefits of the project. There were also concerns about how planning departments and insurance companies might use the information gathered.

"We know that the best education is face-to-face at the person's house, by the local firefighter who is going to be the one responding to the house if needed."

— Justin Dombrowski

include code and policy changes as well as more involvement with planning. "Hopefully, it won't take another big fire to do it," she said.

A question of when

While much has been accomplished throughout Boulder County, significant work remains. The challenge ahead continues to occupy the efforts and thoughts of firefighting professionals and their partners in the government and the community.

New residents arrive in Boulder every day, many from places where wildfire is not a threat and for whom the earlier fires are not a memory. And as with many jurisdictions nationwide, mitigation must often compete for funding and support among other critical needs. It is a balancing act that requires equal parts dedication and creativity.

For communities in the wildland/urban interface, questions about wildfire have to be prefaced by when and where, not if. In the Boulder Valley, that fundamental truth is firmly rooted in the fires that continue to burn across its lands, and in the efforts of residents to pull together and live safely there anyway. ■

Successful Boulder-Area Wildfire Mitigation Initiatives

- ✔ Formation of the Boulder County Wildfire Mitigation Group, which brings government and community leaders together with firefighting professionals and area residents to address issues of shared concern.
- ✔ Creation by the city of Boulder of a full-time wildland fire coordinator position to help manage wildland fire issues on city properties and to work with adjacent fire departments.
- ✔ Formation of the Boulder County Wildland Fire Cooperators to address training and coordination among area fire agencies and cooperators.
- ✔ Initiation by the city of Boulder of a comprehensive prescribed burn program in the wildland/urban interface.
- ✔ Development of a GIS-based risk assessment tool for Boulder County, known as the Wildfire Hazard Identification and Mitigation System (WHIMS).
- ✔ Passage by the city of Boulder of an ordinance phasing out all wood roof coverings.
- ✔ Creation by Boulder County of a full-time wildfire mitigation coordinator position to help deal with wildland fire threats in wildland/urban interface areas of the county.
- ✔ Implementation of a Boulder County site plan review ordinance requiring a wildfire mitigation plan for any new house as a condition of occupancy.
- ✔ Establishment of the Boulder County Ecosystem Cooperative, designed to identify and promote innovative ecosystem restoration opportunities on public and private lands.
- ✔ Passage of a public safety tax in the city of Boulder that funds mitigation and education efforts, including a seasonal Wildfire Response Group that reduces fire fuels on city open spaces.
- ✔ Development of a task force composed of the various county wildland firefighting jurisdictions that can deploy within the county or to nearby counties as a quick-attack hand crew or fire suppression team.
- ✔ Creation of a wildfire evacuation plan for the city of Boulder and neighboring communities, with permanent signs posted on evacuation routes.
- ✔ Establishment of a helicopter firefighting program that makes a helicopter and crew available for the Boulder area and beyond during fire season. ■

EXHIBIT B-5

JUN 0 6 2006
IC-06-06-892
Ravalli County Planning Dept.

To: Dan Hulls chair

working people have a hard time getting
of work (mostly in Missoula) then To Hamilton -
inconvenient for planners & Board - or for the public
who you serve

Cylde Johnson
Florence

LE

■ *Aspen Springs*

Meeting time needs to be changed

I am a member of the Florence Coalition Against Aspen Springs. We received a letter from the Planning Department notifying us of the Planning Board hearing on Aspen Springs. When is it scheduled? At 3 p.m. on Wednesday, June 21 in Hamilton at the county commissioners' meeting room. And where is Aspen Springs? On the north end of the valley, east of Florence, which is approximately 30 miles from Hamilton. What is proposed? Only the largest subdivision that has ever made it to the Ravalli County Planning Board, with 636 homes on 393 acres of land. Plus, they are requesting seven variances. The area has limited water and this subdivision will totally change the fabric of Ravalli County if approved.

Florence is an area that has many commuters who work in Missoula, Stevensville or Hamilton. Some people can make an evening meeting, but not an afternoon meeting in Hamilton. Why has this been scheduled for such an inconvenient time? Even the developer held his public meeting in the evening at the gym in Florence. Could it be that the Planning Board and county commissioners don't want to hear from the public on this subdivision?

Check out our Web site at *FCAAS.com* and come to our meeting planned at the Florence School old gym at 7 p.m. on June 8. Find out more about Aspen Springs and how it will affect you.

Was the meeting on the big box stores held in the middle of the afternoon? No. It was held at the Hamilton Middle School gym at 7 p.m. This public hearing on Aspen Springs needs to be changed to the Florence gym at 7 p.m. on June 21.

Candi Jerke,
Florence